# UNITED STATES PATENT AND TRADEMARK OFFICE

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/422,539 | 10/21/1999 | DING-KAI CHEN | 10981786-1 | 5676 |

22879    7590    06/16/2004

HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

| EXAMINER |
|---|
| KENDALL, CHUCK O |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2122 | 20 |

DATE MAILED: 06/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

*— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *29 March 2004*.

2a)☒ This action is **FINAL**.          2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
      closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *23-63* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23-63* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
          application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

## DETAILED ACTION

### Remarks

1.      This Office Action is the response to the communication received on

March 29, 2004.  Reconsideration of the instant application is requested by

Applicant.  All such supporting documentation has been placed of record in the

file.  Claims 23 - 63 are pending.

### Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102

that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3.  Claims 23,30,36, 40,46,49,54,63 are rejected under 35 U.S.C. 102(e) as

being anticipated by Grove USPN 5,857,103.

Regarding claims 23, 40,46, & 49 a method (Col. 14 line 40 to Col. 16 line 40), a

system  (Col. 16 line 38 to Col. 17 line 17), for passing information to a post-compile-

time software application comprising the steps of:

compiling a plurality of blocks of code including, finding one or more unused bits

in an instruction in one of the plurality of blocks of, and using the one or more unused

bits to encode information (Grove, Col. 10 lines 10-15, also figure 6) without defining

new instructions or opcodes (4:59 - 67, shows using unused bits to encode existing

instructions and not new instructions);

communicating the information to the post-compile-time software application (Grove, 9:58-60, refer to LUT/ look up table, which is used by compiler, also see 13:10 - 35 for LUT and bit pattern).

Regarding claims 30, Examiner is applying the same rationale to claim, which are the systems version of the method claim as discussed in claim 23 above.

Regarding claim 36, which is the system version of claim 23, see rationale as previously discussed above.

Regarding claim 54, a method that is implemented by software, comprising the steps of:

storing a post-compile time software application in memory that is coupled to a processor (8:39 –43, see cache 312 and 314);

compiling blocks of code, including finding unused bits in an instruction in one of the blocks of code, and encoding information as a bit vector in the unused bits (13: 20 – 55, for finding see determines); and

modifying the compiled blocks of code by the post compile time software application, wherein a configuration of the modified and compiled blocks of code is responsive to the information (9:15 – 25).

Regarding claim 63, method of claim 61, wherein the information is encoded without defining new instructions or opcodes (4:59 - 67, shows using unused bits to encode existing instructions and not new instructions).

## Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.  Claims 24 -29, 31-35, 37-39, 41 – 45, 47,48,50 & 59 - 62 rejected under 35 U.S.C. 103(a) as being unpatentable over Grove as applied in claim 23 and in view of Hayashi USPN 5,828,886.

Regarding claims 24, 41, 47, 52,57 & 59 - 62 Grove discloses all the claimed limitations as applied in claim 23 above.  Grove doesn't explicitly discloses, wherein the information identifies whether certain registers are live.  However, Hayashi does disclose this feature (Hayashi, 5:45-50).  Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to Grove and Hayashi because, identifying the status or contents of registers make allocating memory and resources more efficient.

Regarding claims 25, 42, 53, 58 the method of claim 23, wherein the post-compile-time software application comprises a dynamic optimizer (Grove, fig 8, item #808).

Regarding claim 26, 43,48,50,55 Grove discloses all the claimed limitations as applied in claim 23 above.  Grove doesn't explicitly disclose wherein the instruction is a no-operation (NOP) instruction.  However Hayashi does disclose this feature (Hayashi, see Fig 22,for NOP instruction, and live register within block of code).  Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to Grove and Hayashi because, using no op instructions in registers makes memory management more efficient.

Regarding claims 27, the method of claim 23, Hayashi further discloses wherein the information is used by the post-compile-time software application to determine whether certain registers are live (Hayashi, 2:23-27, also see FIG.11, s40 and all associated text).

Regarding claim 28 & 45, the method of claim 23, wherein the information is encoded as a bit vector (Hayashi, 2:23-30, see marking set bits).

Regarding claim 29 the method of claim 23, wherein the step of using the one or more unused bits to pass information to the post-compile-time software application comprises:

determining which of a plurality of registers are live in said one of the plurality of blocks of code (Hayashi, 5:45-50);

creating within the instruction a register-usage bit-vector having a plurality of register-usage bits; and [Hayashi, 5:40-55, see register usage field and setting bit vectors, see Kill or use as indicated by 1 or O for bit vectors in the register information management table as cited from prior art]

setting one of the plurality of register-usage bits for each one of the plurality of registers that are live [Hayashi,5:40-55].

Regarding claims 31 & 37, Examiner is applying the same rationale to claim, which are the systems version of the method claim as discussed in claim 24 above.

Regarding claims 32 & 38, Examiner is applying the same rationale to claim, which are the systems version of the method claim as discussed in claim 25 above.

Regarding claims 33 & 39, Examiner is applying the same rationale to claim, which are the system versions of the method claim as discussed in claim 26 above.

Regarding claims 34, Examiner is applying the same rationale to claim, which is the system version of the method claim as discussed in claim 27 above.

Regarding claim 35, Examiner is applying the same rationale to claim, which is the system version of the method claim as discussed in claim 28 above.

Regarding claim 37, see claim 24 for reasoning.

Regarding claim 38, see claim 25 for reasoning.

Regarding claim 39, see claim 26 for reasoning.

Regarding claim 44, which also describes a method similar to claim 27, see rationale as previously discussed above.

Regarding claim 51, which is the system version of claim 27, see rationale as previously discussed above.

Regarding claim 56, which also describes a method similar to claim 27, see rationale as previously discussed above.

**Response to Arguments**

6.    Applicant's arguments filed Applicant's arguments filed 03/29/2004 have been fully considered but they are not persuasive.

Regarding Applicant's limitation of "without defining new instructions or opcodes...", as amended in independent claims 23, 30, 36 & 40,  Examiner believes the prior art of record Groove still teaches this limitation.  As set forth above and as recited in Groove in 4:59 - 67, Groove shows using unused bits to encode existing instructions and not new instructions.  Although, Groove does have a separate embodiment which does encoded new instructions Groove also additionally teaches using the unused bits to perform other operations see Groove,3:45 –50 and 4:60-65 also see 10:60-65.

*Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action.  Accordingly, **THIS ACTION IS MADE FINAL**.  See MPEP § 706.07(a).  Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action.  In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

### Correspondence Information

7.    Any inquires concerning this communication or earlier

communications from the examiner should be directed to Chuck O.

Kendall who may be reached via telephone at (703) 308-6608. The

examiner can normally be reached Monday through Friday between 8:00

A.M. and 5:00 P.M. est.

If attempts to reach the examiner by telephone are unsuccessful, the

examiner's supervisor, Tuan Dam *can be* reached at *(703) 305-4552.*

Any inquiry of a general nature or relating to the status of this

application or proceeding should be directed to the Group receptionist

whose telephone number is (703) 305-3900.

For facsimile (fax) send to central FAX number 703-872-9306 *and*

703-7467240 draft.

*Chuck O. Kendall*

*Software Engineer Patent Examiner*

TUAN DAM
SUPERVISORY PATENT EXAMINER